

Net Radiation Transmitter

Instruction for use 7.1415.10.000



General Information

The net radiation transmitter is an instrument designed to determine the radiation balance of a surface directly and immediately.

The radiation balance is the difference between the radiation energy incident to the surface unit of the earth's surface and the energy emitted by this surface in the upper hemisphere.

Short wave global radiation and long wave atmospheric radiation are measured according to their temperatures by the upper radiation-sensitive surface of the instrument. The lower radiation-sensitive surface measures the reflected short wave radiation and the long wave radiation in accordance with the surface temperature of the background.

Irradiation	Global radiation consisting of : Direct solar radiation Diffuse sky radiation Atmospheric radiation
Radiation	Reflected global radiation Reflected atmospheric radiation Temperature radiation from the surface of the earth

For direct determination of the radiation balance, both radiation-sensitive surface have been cross connected. The plus sign indicates radiation incident to the surface of the earth i.e. the reference surface gains radiation energy. If the radiation balance is preceded by a minus sign, this means that energy is being drawn off the reference surface.

2. Construction

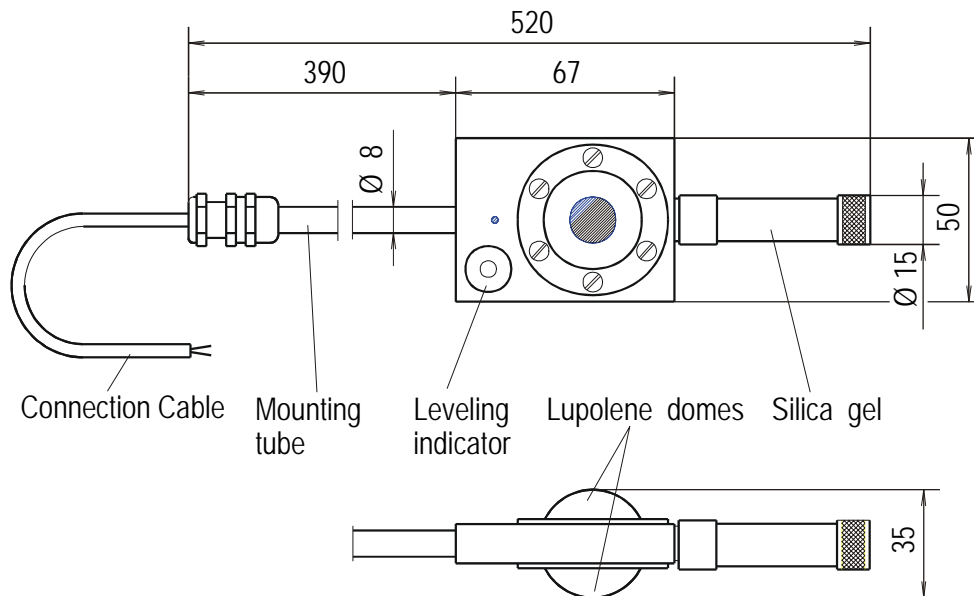
Thermopiles, consisting of Cu-CuNi thermo-elements covered by 2 blackened radiation-sensitive surfaces, are situated in the middle of the instrument and are the radiation-sensitive part of the instrument. These thermopiles are protected from external influences by lupolen domes. Two integrated levels make it possible to align the instrument horizontally.

There is a removable container for the dry agent (silica gel) which has been mounted to the side of the sensor such that it does not in any way block the upper or the lower hemisphere. A 400 mm long holding tube simplifies mounting.

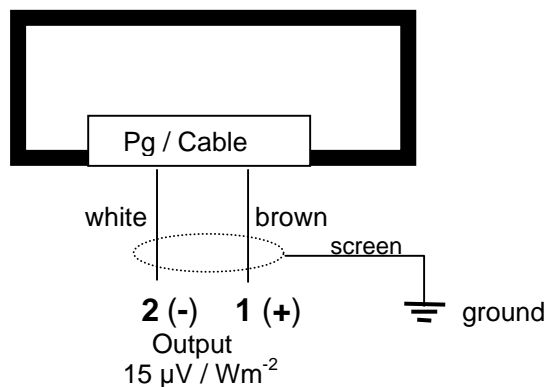
Technical Data

Measuring range	: 0 ... + 1500 Wm ⁻²
Spectral range	: 0,3 – 30 μm
Electrical output	: about 15 μV / Wm ⁻²
	Factory calibration certificate in accordance with DIN 50 049 – 2.3 is enclosed with the instrument
Impedance	: about 5 Ω
Classification	: “first class” according to WMO
Ambient temperature	: - 40 °C ... + 60 °C
Resolution	: < 1 Wm ⁻²
Stability	: < 3 % per year when (temporary operation)
Cosine effect	: < 5 % of the measuring value, zenith angle 0° ... 80°
Azimuth effect	: < 5 % of the measuring value
Temperature influence	: < 2 % of the measuring value between – 20 °C ... + 40 °C
Non-linearity	: < 2 % of the range between 0,5 ... 1330 Wm ⁻²
Adjustment time	: < 25 sec (95 %) < 45 sec (99 %)
Connecting cable	: 10 m long, LiYCY 2 x 0,34 mm ²
Weight	: 0,35 kg

Dimensions



Connecting diagram



4. Mounting

The radiation balance transmitter must be installed such that the instrument is perfect horizontal and accessible for maintenance. The site should be at a reasonable distance from light-colored walls which reflect sunlight.

The radiation balance transmitter should be set up perfectly horizontally between 1 m and 1,5 m above a grassy area. The integrated levels guarantee perfect alignment. The site of the instrument with the red point should be aligned facing upwards, the side with the two points should be aligned downwards (reflection).

5. Maintenance

The lupolen domes should be checked for transparency regularly – the best time to do this is in the morning as, on clear nights, dew, ice or rain could interfere with the transparency. Clean the domes carefully with distilled water.

Note : Damaged or perforated domes have to be changed immediately.

Silica gel should always be of blue colour. When it is getting pink, it should be exchanged. The container is easily removed by screwing. The agent may be dried 80 °C in case no fresh silica gel is available.



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